Catalytic Performance of Ni/CeO_2/X-ZrO_2 (X = Ca, Y) Catalysts in the Aqueous-Phase Reforming of Methanol

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Supporting Information

Table S1. Composition from ICP (%w/w) of the fresh and used catalysts.

Catalysts	Before reaction					After reaction				
	Ni	Ce	Ca	Y	Zr	Ni	Ce	Ca	Y	Zr
NiZr	7.0±0.1	--	--	--	60.0±0.6	7.1±0.1	--	--	--	58.0±0.6
NiCeZr	5.9±0.1	12.6±0.2	--	--	48.4±0.1	5.6±0.1	13.1±0.2	--	--	46.2±0.1
Ni4CSZ	5.0±0.1	--	1.2±0.1	--	60.0±0.6	5.2±0.1	--	1.1±0.1	--	59.8±0.6
NiCe4CSZ	5.9±0.2	13.0±0.1	1.8±0.1	--	47.6±0.3	6.1±0.2	14.0±0.1	1.6±0.1	--	48.4±0.3
Ni8YSZ	5.6±0.2	--	--	4.3±0.1	56.4±0.3	5.8±0.2	--	--	4.1±0.1	57.2±0.3
NiCe8YSZ	5.5±0.1	12.7±0.1	--	3.6±0.1	46.1±0.2	5.5±0.1	13.0±0.1	--	3.9±0.1	48.2±0.2
Ni14CSZ	6.9±0.1	--	4.9±0.1	--	53.0±0.3	6.7±0.1	--	4.6±0.1	--	57.1±0.3
NiCe14CSZ	5.5±0.2	13.5±0.2	4.0±0.1	--	43.3±0.6	5.6±0.2	13.2±0.2	3.8±0.1	--	43.5±0.6

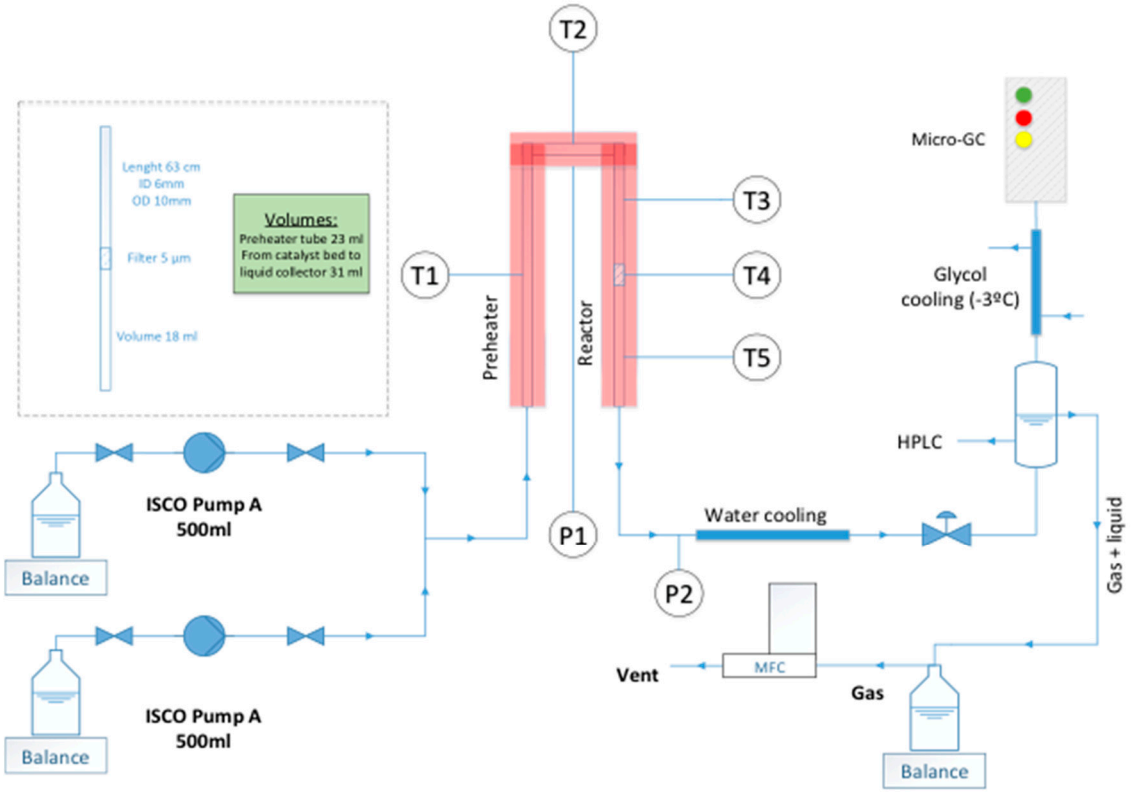


Figure S1. Experimental setup for APR of methanol.

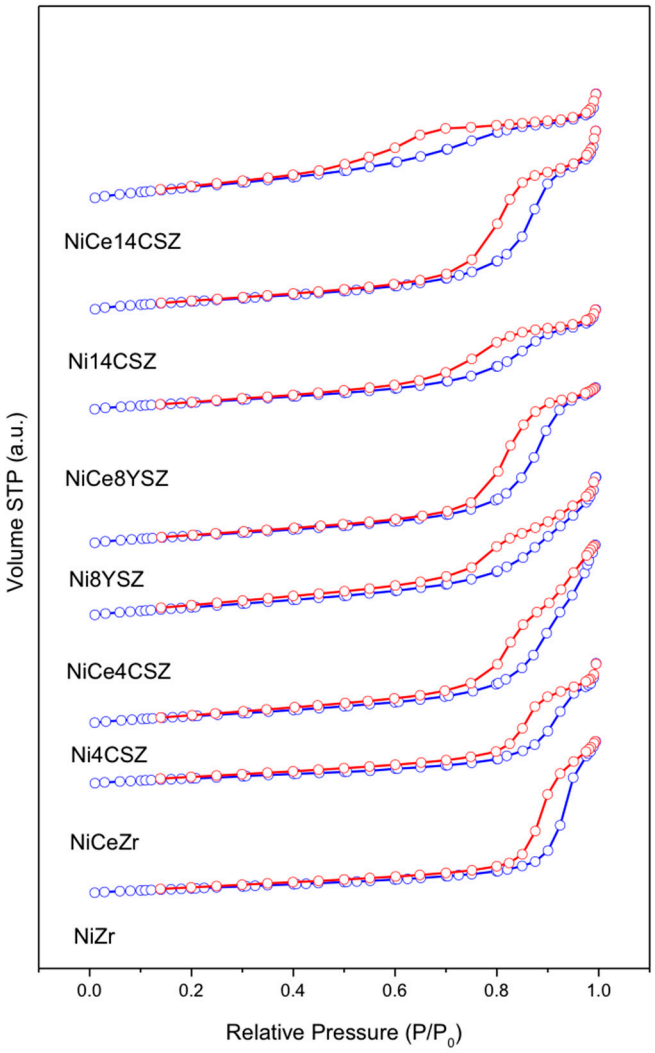


Figure S2. N_2 isotherms.

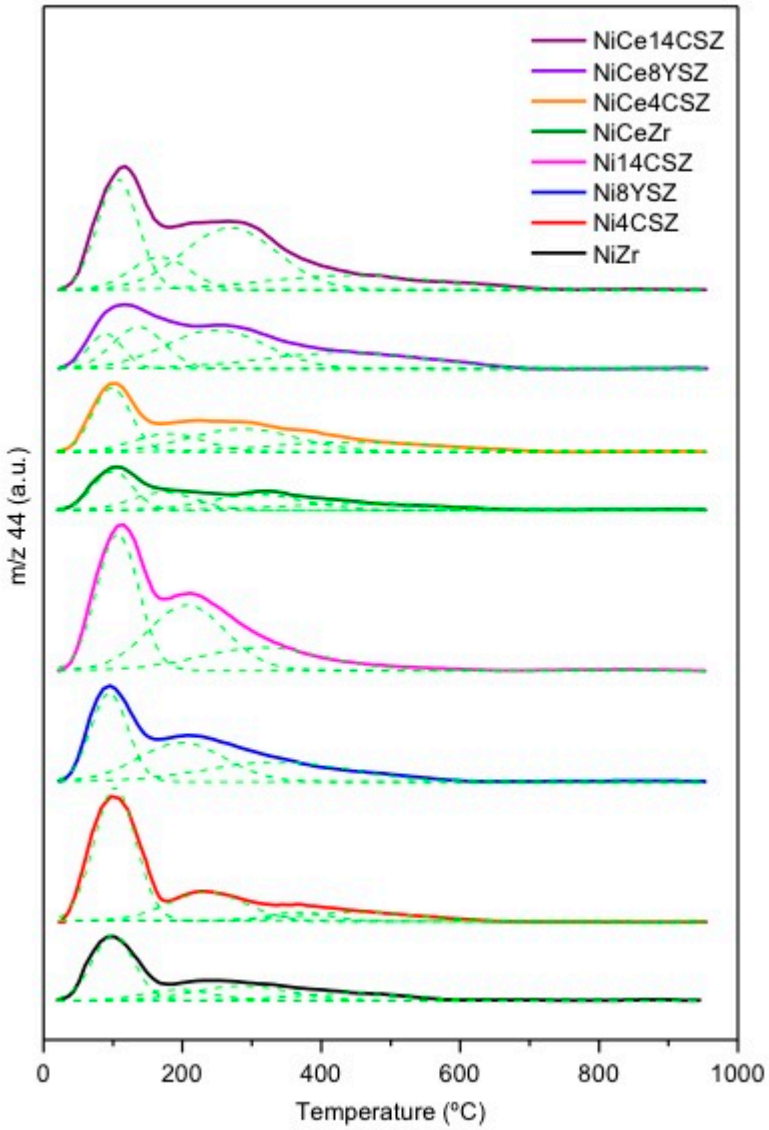


Figure S3. CO_2-TPD profiles showing deconvoluted peaks.

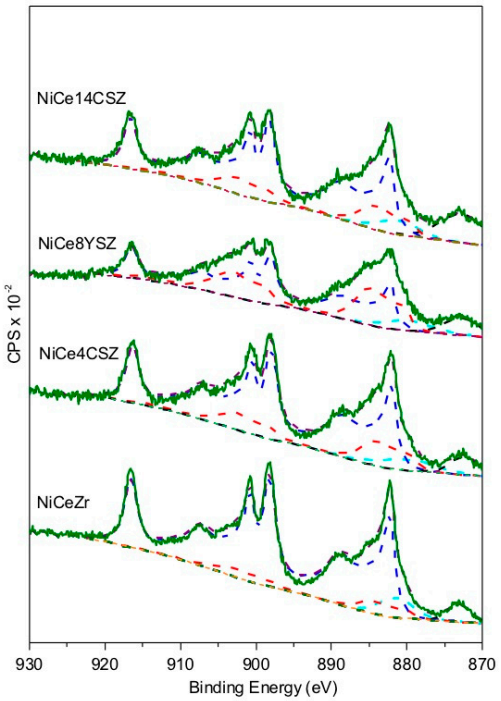
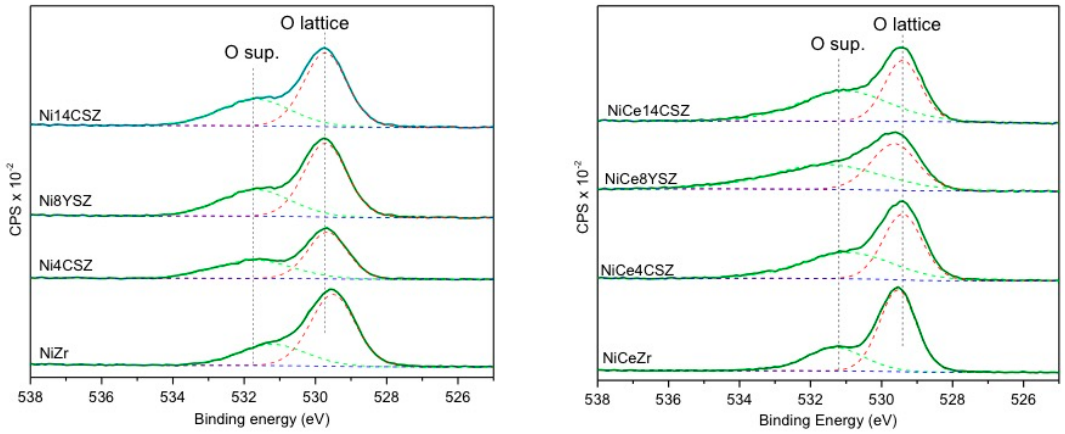


Figure S4. Ce 3d XPS spectra.



(a) (b)

Figure S5. O 1s XPS spectra: **(a)** Samples without Ce; **(b)** Samples with Ce.

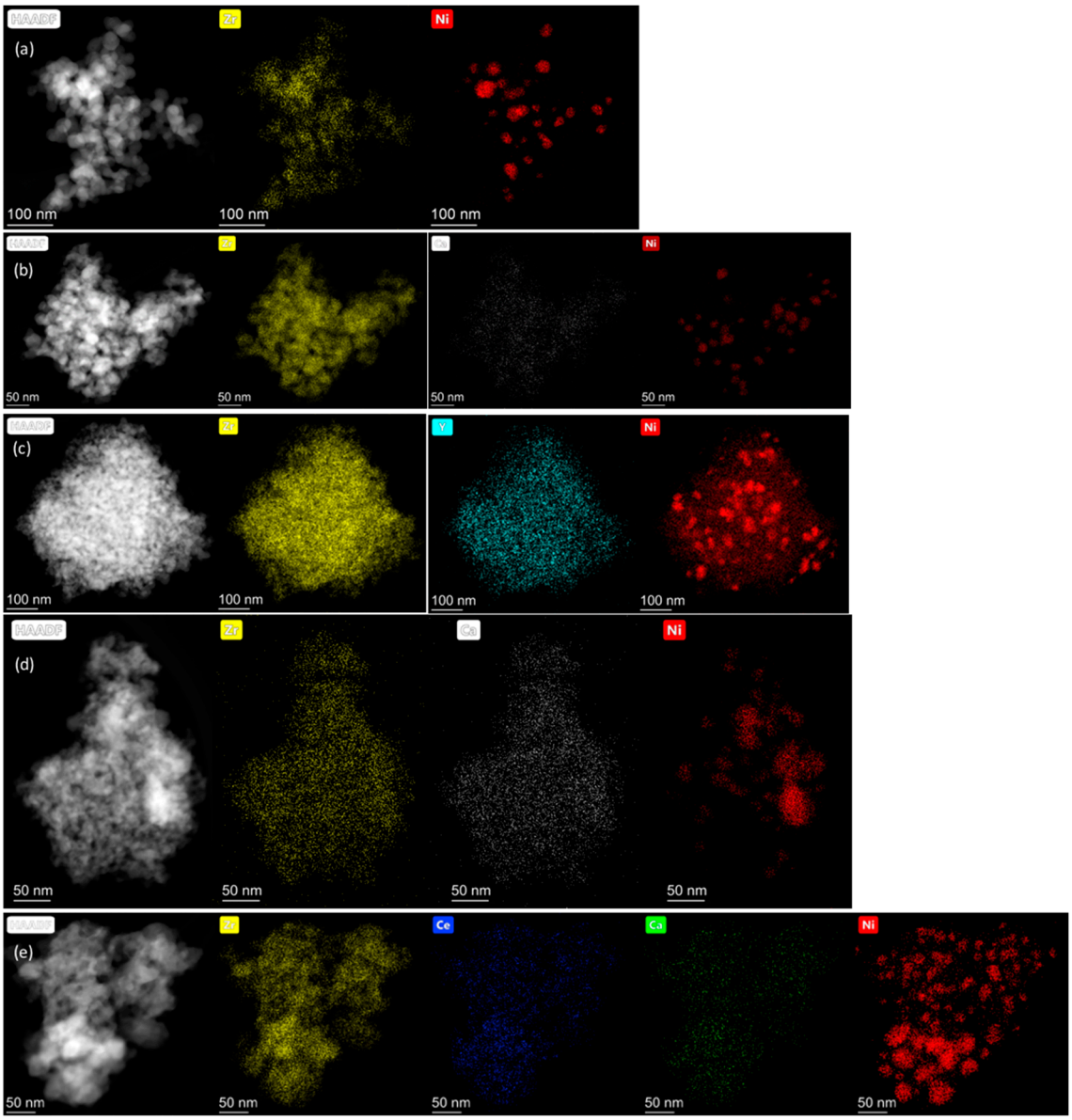


Figure S6. HAADF images and EDS maps for individual components: (a) NiZr, (b) Ni4CSZ, (c) Ni8YSZ, (d) Ni14CSZ and (e) NiCe4CSZ